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**Notes:**

1. Untranslatable words are replaced with asterisks (\* \*\*).
2. Texts in the figures are not translated and shown as if #.

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## CLAIM + DETAILED DESCRIPTION

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**[Claim(s)]**

[Claim 1] A traffic information acquisition means which acquires traffic information which includes congestion information at least, A gauge creating means which generates a gauge which shows a complete process cycle of a guidance route which defined a route which he should follow, A symbol creating means which generates a symbol which specifies traffic jam distance and congested extent on a guidance route, and shows traffic jam distance and congested extent which were specified according to traffic information which said traffic information acquisition means acquired, A symbol which said symbol creating means generated is compounded in a corresponding position on a gauge which said gauge creating means generated, A navigation system provided with an indicator image creating means which generates an indicator image in which a traffic congestion position, traffic jam distance, and congested extent on a guidance route are shown, and a displaying means which displays an indicator image which said indicator image creating means generated.

[Claim 2] A navigation system comprising:

A guidance route information storage means which memorizes guidance route information which specifies a guidance route which defined a route which he should follow.

A VICS information acquisition means which acquires VICS (Vehicle Information Communication System) information which includes congestion information at least.

A gauge creating means which generates a gauge which shows a complete process cycle of a guidance route according to guidance route information memorized by said guidance route information storage means.

[ according to VICS information which said VICS information acquisition means acquired, and guidance route information memorized by said guidance route information storage means ] A symbol creating means which generates a symbol which specifies traffic jam distance and congested extent on a guidance route, and shows traffic jam distance and congested extent

which were specified, A symbol which said symbol creating means generated is compounded in a corresponding position on a gauge which said gauge creating means generated, An indicator image creating means which generates an indicator image in which a traffic congestion position, traffic jam distance, and congested extent on a guidance route are shown, and a displaying means which compounds and displays an indicator image which said indicator image creating means generated on a map image.

[Claim 3]An area selection means to choose arbitrary fields in an indicator image displayed on said displaying means, The navigation system according to claim 1 or 2 characterized by what it has further a position specification means to pinpoint a position on a guidance route corresponding to a field selected by said area selection means, and said displaying means displays a map image corresponding to a position pinpointed by said position specification means for.

[Claim 4]The traffic congestion condition method of presentation comprising:

A traffic information acquisition step which acquires traffic information which includes congestion information at least.

A gauge generation step which generates a gauge which shows a complete process cycle of a guidance route which defined a route which he should follow.

A symbol generation step which generates a symbol which specifies traffic jam distance and congested extent on a guidance route, and shows traffic jam distance and congested extent which were specified according to traffic information acquired in said traffic information acquisition step.

A symbol generated in said symbol generation step is compounded in a corresponding position on a gauge generated in said gauge generation step, An indicator image generation step which generates an indicator image in which a traffic congestion position, traffic jam distance, and congested extent on a guidance route are shown, and a displaying step which displays an indicator image generated in said indicator image generation step on a predetermined indicator.

[Claim 5]A recording medium characterized by comprising the following which recorded a program for making a computer perform the traffic congestion condition method of presentation and in which computer reading is possible.

A traffic information acquisition step which acquires traffic information which includes congestion information at least.

A gauge generation step which generates a gauge which shows a complete process cycle of a guidance route which defined a route which he should follow.

A symbol generation step which generates a symbol which specifies traffic jam distance and

congested extent on a guidance route, and shows traffic jam distance and congested extent which were specified according to traffic information acquired in said traffic information acquisition step.

A symbol generated in said symbol generation step is compounded in a corresponding position on a gauge generated in said gauge generation step, An indicator image generation step which generates an indicator image in which a traffic congestion position, traffic jam distance, and congested extent on a guidance route are shown, and a displaying step which displays an indicator image generated in said indicator image generation step on a predetermined indicator.

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#### [Detailed Description of the Invention]

[0001]

[Field of the Invention]This invention relates to the navigation system, the traffic congestion condition method of presentation, and the recording medium which can display the traffic congestion condition outside a display rectangle appropriately.

[0002]

[Description of the Prior Art]The conventional navigation system searches the guidance route from the origin of the vehicles (henceforth a "self-vehicle") which carry a navigation system to the destination from a predetermined traffic information, for example. And the current position of a self-vehicle is acquired one by one by a predetermined GPS (Global Positioning System) unit etc., and the navigation picture which compounded the symbol which shows a current position, the guidance route, etc. is generated. A navigation system displays the generated navigation picture on a predetermined indicator etc. Thereby, the user can advance a self-vehicle to the destination which should go without losing one's way according to the displayed navigation picture.

[0003]In recent years, the VICS (Vehicle Information Communication System) system which provides a user with congestion information, traffic restriction information, etc. via light and a radio wave beacon, or an FM multiplex broadcast is put in practical use. The conventional navigation system corresponding to such a VICS system is explained with reference to Drawings. Drawing 13 is a block diagram showing the composition of the conventional navigation system 100.

[0004]The navigation system 100 comprises light and the radio wave beacon receiving unit 110, the FM multiplex broadcast receiving unit 120, the navigation processing section 130, CD-ROM140, and the monitor 150 so that it may illustrate.

[0005]Light and the radio wave beacon receiving unit 110 receive the light beacon or radio

wave beacon sent from the predetermined VICS information sending set formed in the place along the route. The FM multiplex broadcast receiving unit 120 receives the FM multiple signals similarly sent from the predetermined VICS information sending set formed in the place along the route. Light and radio wave beacon receiving unit 110 grade generate VICS information from the light beacon etc. which were received, and supplies it to the navigation processing section 130.

[0006]The navigation processing section 130 ROM (Read Only Memory), It consists of a one-chip microcomputer etc. which comprise RAM (Random Access Memory), a CPU (Central Processing Unit), etc., and the navigation system 100 whole is controlled.

[0007]CD-ROM140 memorizes map information and a traffic information. The map information memorized by CD-ROM140 is read via a predetermined driver unit, and is supplied to the navigation processing section 130.

[0008]The monitor 150 consists of LCD (Liquid Crystal Display) or a CRT (Cathode Ray Tube), and displays the navigation picture which the navigation processing section 130 generated.

[0009]The navigation processing section 130 specifies a position, distance, etc. of a traffic congestion place according to the acquired congestion information, if light, the radio wave beacon receiving unit 110, etc. acquire VICS information (congestion information etc.) clitteringly. And the navigation processing section 130 displays a navigation picture as shown in drawing 14 (a) on the monitor 150. Since the symbol 152 which shows the symbol 151 and traffic congestion place which show a self-vehicle position is contained, the user can advance a self-vehicle to the navigation picture shown in drawing 14 (a) to the destination in accordance with a guidance route, checking a traffic congestion condition.

[0010]

[Problem to be solved by the invention]The navigation system 100 corresponding to an above-mentioned VICS system will perform re retrieval of a guidance route, if a light beacon and a radio wave beacon are received during guidance. In that case, in consideration of congestion information etc., re retrieval of a guidance route may be performed so that it can arrive at the destination by shortest time etc.

[0011]However, in the case where FM multiple signals receive the traffic information of a wide area, navigation system 100 grade does not perform re retrieval of a guidance route. Therefore, the user scrolled suitably the navigation picture displayed on the monitor 150, and was checking the traffic congestion condition on a guidance route.

[0012]If it explains concretely, [ picture / as shown in drawing 14 (a) / navigation ] Since the traffic congestion condition outside a display rectangle was not able to be checked, as a predetermined final controlling element was operated and it was shown in drawing 14 (b), you turn a navigation picture to a direction of movement, and the user made it scroll, displayed the icon 152 which shows the traffic congestion place on a guidance route, and was checking the

traffic congestion condition.

[0013] That is, in order to check the traffic congestion condition outside the display rectangle of a navigation picture, the user needed to scroll the navigation picture suitably each time. Such scroll operation was very complicated, and it was not preferred that the user who is operating operates it.

[0014] This invention was made in view of the above-mentioned actual condition, and an object of this invention is to provide the navigation system, the traffic congestion condition method of presentation, and the recording medium which can display the traffic congestion condition outside a display rectangle appropriately.

[0015]

[Means for solving problem] In order to attain the above-mentioned purpose, the navigation system concerning the 1st viewpoint of this invention is provided with the following.

The traffic information acquisition means which acquires the traffic information which includes congestion information at least.

The gauge creating means which generates the gauge which shows the complete process cycle of the guidance route which defined the route which he should follow.

The symbol creating means which generates the symbol which specifies the traffic jam distance and congested extent on a guidance route, and shows the traffic jam distance and congested extent which were specified according to the traffic information which said traffic information acquisition means acquired, The symbol which said symbol creating means generated is compounded in the corresponding position on the gauge which said gauge creating means generated, The indicator image creating means which generates the indicator image in which the traffic congestion position, traffic jam distance, and congested extent on a guidance route are shown, and the displaying means which displays the indicator image which said indicator image creating means generated.

[0016] According to this invention, a traffic information acquisition means consists of a VICS module etc. which receive VICS information, for example, and acquires the traffic information which includes congestion information at least. A gauge creating means generates the gauge which shows the complete process cycle of the guidance route which defined the route which he should follow. A symbol creating means generates the symbol which specifies the traffic jam distance and congested extent on a guidance route, and shows the traffic jam distance and congested extent which were specified according to the traffic information which the traffic information acquisition means acquired. An indicator image creating means compounds the symbol which the symbol creating means generated in the corresponding position on the gauge which the gauge creating means generated, and generates the indicator image in which the traffic congestion position, traffic jam distance, and congested extent on a guidance route

are shown. A displaying means displays the indicator image which the indicator image creating means generated for example, with a navigation picture. As a result, the traffic congestion condition outside a display rectangle can be appropriately displayed with the indicator image in which the traffic congestion position in a complete process cycle, traffic jam distance, and congested extent of a guidance route are shown.

[0017]In order to attain the above-mentioned purpose, the navigation system concerning the 2nd viewpoint of this invention is provided with the following.

The guidance route information storage means which memorizes the guidance route information which specifies the guidance route which defined the route which he should follow. The VICS information acquisition means which acquires the VICS information which includes congestion information at least.

The gauge creating means which generates the gauge which shows the complete process cycle of a guidance route according to the guidance route information memorized by said guidance route information storage means, [ according to the VICS information which said VICS information acquisition means acquired, and the guidance route information memorized by said guidance route information storage means ] The symbol creating means which generates the symbol which specifies the traffic jam distance and congested extent on a guidance route, and shows the traffic jam distance and congested extent which were specified, The symbol which said symbol creating means generated is compounded in the corresponding position on the gauge which said gauge creating means generated, The indicator image creating means which generates the indicator image in which the traffic congestion position, traffic jam distance, and congested extent on a guidance route are shown, and the displaying means which compounds and displays the indicator image which said indicator image creating means generated on a map image.

[0018]According to this invention, a guidance route information storage means memorizes the guidance route information which specifies the guidance route which defined the route which he should follow. A VICS information acquisition means consists of a VICS receiving module etc., and acquires the VICS information which includes congestion information at least, for example. A gauge creating means generates the gauge which shows the complete process cycle of a guidance route according to the guidance route information memorized by the guidance route information storage means. A symbol creating means generates the symbol which specifies the traffic jam distance and congested extent on a guidance route, and shows the traffic jam distance and congested extent which were specified according to the VICS information which the VICS information acquisition means acquired, and the guidance route information memorized by the guidance route information storage means. An indicator image creating means compounds the symbol which the symbol creating means generated in the

corresponding position on the gauge which the gauge creating means generated, and generates the indicator image in which the traffic congestion position, traffic jam distance, and congested extent on a guidance route are shown. A displaying means compounds and displays the indicator image which the indicator image creating means generated on a map image. As a result, the traffic congestion condition outside a display rectangle can be appropriately displayed with the indicator image in which the traffic congestion position in a complete process cycle, traffic jam distance, and congested extent of a guidance route are shown.

[0019]An area selection means to choose the arbitrary fields in the indicator image displayed on said displaying means, It may have further a position specification means to pinpoint the position on the guidance route corresponding to the field selected by said area selection means, and said displaying means may display the map image corresponding to the position pinpointed by said position specification means. In this case, selection of the field of the traffic congestion place in an indicator image will display the map image corresponding to a traffic congestion place. As a result, the traffic congestion place outside a display rectangle can be displayed by easy operation.

[0020]In order to attain the above-mentioned purpose, the traffic congestion condition method of presentation concerning the 3rd viewpoint of this invention is provided with the following. The traffic information acquisition step which acquires the traffic information which includes congestion information at least.

The gauge generation step which generates the gauge which shows the complete process cycle of the guidance route which defined the route which he should follow.

The symbol generation step which generates the symbol which specifies the traffic jam distance and congested extent on a guidance route, and shows the traffic jam distance and congested extent which were specified according to the traffic information acquired in said traffic information acquisition step, The symbol generated in said symbol generation step is compounded in the corresponding position on the gauge generated in said gauge generation step, The indicator image generation step which generates the indicator image in which the traffic congestion position, traffic jam distance, and congested extent on a guidance route are shown, and the displaying step which displays the indicator image generated in said indicator image generation step on a predetermined indicator.

[0021]According to this invention, a traffic information acquisition step acquires the traffic information which includes congestion information at least. A gauge generation step generates the gauge which shows the complete process cycle of the guidance route which defined the route which he should follow. A symbol generation step generates the symbol which specifies the traffic jam distance and congested extent on a guidance route, and shows the traffic jam

distance and congested extent which were specified according to the traffic information acquired in the traffic information acquisition step. An indicator image generation step compounds the symbol generated in the symbol generation step in the corresponding position on the gauge generated in the gauge generation step, and generates the indicator image in which the traffic congestion position, traffic jam distance, and congested extent on a guidance route are shown. A displaying step displays the indicator image generated in the indicator image generation step on a predetermined indicator. As a result, the traffic congestion condition outside a display rectangle can be appropriately displayed with the indicator image in which the traffic congestion position in a complete process cycle, traffic jam distance, and congested extent of a guidance route are shown.

[0022]In order to attain the above-mentioned purpose, [ the recording medium concerning the 4th viewpoint of this invention ] The traffic information acquisition step which acquires the traffic information which includes congestion information at least, The gauge generation step which generates the gauge which shows the complete process cycle of the guidance route which defined the route which he should follow, The symbol generation step which generates the symbol which specifies the traffic jam distance and congested extent on a guidance route, and shows the traffic jam distance and congested extent which were specified according to the traffic information acquired in said traffic information acquisition step, The symbol generated in said symbol generation step is compounded in the corresponding position on the gauge generated in said gauge generation step, The indicator image generation step which generates the indicator image in which the traffic congestion position, traffic jam distance, and congested extent on a guidance route are shown, The program for making a computer perform the traffic congestion condition method of presentation which has a displaying step which displays the indicator image generated in said indicator image generation step on a predetermined indicator is recorded.

[0023]

[Mode for carrying out the invention]The navigation system concerning an embodiment of the invention is explained with reference to Drawings below.

[0024]Drawing 1 is a mimetic diagram showing an example of the navigation system applied to this embodiment of the invention. This system comprises the GPS antenna 1, GPS module 2, the VICS antenna 3, the VICS module 4, CD-ROM5, the storage part 6, the processing control part 7, the final controlling element 8, and the indicator 9.

[0025]This navigation system is carried in vehicles, such as a car, and guides a user appropriately to a destination by combining with map information etc. a guidance route which shows a route which should progress from a its present location to a destination, and displaying it, for example. Hereafter, a thing of vehicles which carry a navigation system is called "self-vehicle."



[0026]The GPS (Global Positioning System) antenna 1 consists of a helical-type antenna, a dielectric antenna, a patched type flat antenna, etc., and receives a satellite electric wave which a predetermined GPS Satellite sends and by which spectrum spread modulation was carried out.

[0027]It is transmitted from two or more GPS Satellites, and GPS module 2 is aligned with a satellite electric wave which the GPS antenna 1 received, carries out the back-diffusion-of-gas recovery of each satellite electric wave, respectively, and acquires two or more satellite reception signals. GPS module 2 generates position information which consists of LAT, LONG, altitude, etc. based on a difference of attainment time of each satellite electric wave computed according to each acquired satellite reception signal. GPS module 2 supplies generated position information to the processing control part 7 for every predetermined timing.

[0028]The VICS (Vehicle Information Communication System) antenna 3 consists of a predetermined rod antenna etc., and receives FM multiple signals etc. which were sent from a predetermined VICS information sending set formed in a place along the route.

[0029]The VICS module 4 restores to FM multiple signals etc. which the VICS antenna 3 received, and acquires VICS information 41 as shown in drawing 2. Information, including distance of VICS link information, type information, a position, the traffic congestion section, etc., etc., is included in VICS information 41 shown in drawing 2. The VICS module 4 supplies acquired VICS information 41 to the processing control part 7 one by one.

[0030]Returning to drawing 1, CD-DOM5 memorizes map information for a display, and it memorizes the traffic information 51 as shown in drawing 3. Information on road link information, the length of a road, a road link / VICS link correspondence table, a starting point position of a road, an end point position of a road, etc. is included in the traffic information 51 shown in drawing 3. A road link / VICS link correspondence table performs matching with road link information and VICS link information in VICS information 41. Traffic information 51 grade memorized by CD-ROM5 is suitably read by driver unit which is not illustrated, and is supplied to the processing control part 7.

[0031]Returning to drawing 1, the storage part 6 consists of RAM (Random Access Memory) etc., and memorizes the TWY data supplied from the processing control part 7. This TWY data comprises information which specifies the route which should progress from the present location etc. from which the processing control part 7 searched and acquired the traffic information 51 memorized by CD-ROM5 to the destination. The storage part 6 memorizes the traffic congestion list 61 as shown in drawing 4. The traffic congestion list 61 shown in drawing 4 comprises two or more congestion information. The information on traffic congestion classification, distance, a traffic congestion starting point position, a traffic congestion end point position, etc. is included in each congestion information so that it may illustrate. Traffic congestion classification consists of traffic congestion, confusion, favorable condition,

ignorance, those without data, etc., for example.

[0032]Returning to drawing 1, the processing control part 7 consists of a one-chip microcomputer provided with ROM (Read Only Memory), RAM, and CPU (Central Processing Unit) etc., for example, and controls the whole navigation system. Concretely, the processing control part 7 will update the traffic congestion list 61 memorized to the storage part 6 according to acquired VICS information 41, if VICS information 41 is acquired from the VICS module 4. And the processing control part 7 generates the indicator image 70 as shown in drawing 5 (a) according to the updated traffic congestion list 61.

[0033]This indicator image 70 is a picture which shows the traffic congestion condition on a guidance route simply, shows the starting points (origin etc.) - terminal points (destination etc.) in a straight line (rectangle), and expresses the traffic congestion condition with the symbol 71 which shows a traffic congestion place and the symbol 72 which shows a confusion part. The symbols 71 and 72 are expressed as a different color so that a user can recognize congested extent etc. visually. The symbol 73 shows the self-vehicle position on a guidance route. The processing control part 7 compounds the indicator image 70 in the navigation picture which generated and generated the navigation picture according to the map information memorized by CD-ROM5, and as shown in drawing 5 (b), it displays it on the indicator 9.

[0034]When the processing control part 7 generates the indicator image 70, it generates symbol 71 grade in consideration of intermittence traffic congestion. When are explained concretely and the traffic congestion A - the traffic congestion C have occurred intermittently on a guidance route as shown in drawing 6 (a), it is distinguished from the distance (distance between traffic congestion A-B, and distance between traffic congestion B-C) during each traffic congestion whether it is intermittence traffic congestion. For example, when the distance during each traffic congestion is less than (for example, less than 2%) several percent of point distance always, the processing control part 7 distinguishes that it is intermittence traffic congestion.

[0035]. [ namely, the traffic congestion A shown in drawing 6 (a) - the traffic congestion C ] Since the distance between traffic congestion A-B is less than 2% of point distance always, the traffic congestion A and the traffic congestion B are distinguished as it is intermittence traffic congestion, and the indicator image 70 containing the symbol 71 which shows the traffic congestion place where the traffic congestion A as shown in drawing 6 (b), and the traffic congestion B were united is generated. As similarly shown in drawing 6 (c), when the confusion X, the traffic congestion Y, and the confusion Z have occurred on a guidance route, the processing control part 7 generates the indicator image 70 containing the symbols 71 and 72 with which the confusion X as shown in drawing 6 (d), and the traffic congestion Y were connected.

[0036]Returning to drawing 1, the final controlling element 8 consists of a predetermined

navigational panel etc., and supplies various information to the processing control part 7 according to alter operation by a user. For example, the final controlling element 8 inputs coordinate information indicating a destination, etc. according to a user's operation, and supplies them to the processing control part 7.

[0037]The indicator 9 consists of LCD (Liquid Crystal Display) or a CRT (Cathode RayTube), and displays a navigation picture etc. by which the indicator image 70 was compounded.

[0038]Hereafter, operation of a navigation system concerning this embodiment of the invention is explained with reference to Drawings. First, a traffic congestion list update process is explained with reference to drawing 7. Drawing 7 is a flow chart for explaining a traffic congestion list update process. A traffic congestion list update process shown in drawing 7 is started whenever the VICS module 4 receives FM multiple signals etc. which were sent from a predetermined VICS information sending set formed in a place along the route.

[0039]First, the processing control part 7 acquires VICS information 41 from the VICS module 4 (Step S11). That is, the processing control part 7 acquires VICS information 41 which the VICS module 4 restored to FM multiple signals etc., and generated.

[0040]The processing control part 7 distinguishes whether the contents of VICS information 41 are congestion information (Step S12). That is, the processing control part 7 distinguishes whether it is congestion information according to the type information included in VICS information 41.

[0041]When the processing control part 7 was not congestion information and it distinguishes, it ends a traffic congestion list update process. On the other hand, when it distinguishes that it is congestion information, the processing control part 7 pinpoints a corresponding road link using the VICS link information included in VICS information 41 (Step S13). That is, the processing control part 7 uses the road link / VICS link correspondence table contained in the traffic information 51 memorized by CD-ROM5, and pinpoints the road link corresponding to VICS link information.

[0042]The processing control part 7 distinguishes whether the pinpointed road link is on a guidance route (Step S14). That is, the processing control part 7 compares the TWY data memorized by the pinpointed road link and the storage part 6, and distinguishes whether a road link is on a guidance route.

[0043]When the processing control part 7 was not on the guidance route and it distinguishes, it ends a traffic congestion list update process. On the other hand, when it distinguishes that it is on a guidance route, the processing control part 7 distinguishes whether congestion information applicable during the traffic congestion list 61 exists (Step S15). That is, it is distinguished whether the congestion information of the same part is already contained during the traffic congestion list 61.

[0044]When there was no applicable congestion information and it distinguishes, the

processing control part 7 generates new congestion information, and adds it to the traffic congestion list 61 (Step S16).

[0045]When there was applicable congestion information and it distinguishes on the other hand, the processing control part 7 updates the contents of the target congestion information (Step S17). That is, the processing control part 7 changes the distance in congestion information, etc. Thus, the traffic congestion list 61 in which VICS information was reflected one by one is maintained by a traffic congestion list update process.

[0046]Next, navigation processing is explained with reference to drawing 8. Drawing 8 is a flow chart for explaining navigation processing. The guidance route from a departure point to the destination is selected, and the navigation processing shown in drawing 8 is started after the TWY data which specifies a guidance route to the storage part 6 is memorized.

[0047]First, the processing control part 7 acquires a current position of a self-vehicle according to position information sent from GPS module 2 (Step S21).

[0048]The processing control part 7 performs indicator image generation processing (Step S22). This indicator image generation processing is processing which generates an indicator image according to TWY data and the traffic congestion list 61 which were memorized by the storage part 6. Details of indicator image generation processing are mentioned later.

[0049]The processing control part 7 generates a navigation picture (Step S23). That is, the processing control part 7 reads from CD-ROM5 map information including a current position of a self-car acquired at Step S21, and generates a navigation picture which compounded a symbol, a guidance route, etc. which show a current position to read map information.

[0050]The processing control part 7 compounds an indicator image in a navigation picture, and displays it on the indicator 9 (Step S24). Namely, the processing control part 7 superimposes an indicator image in which a traffic congestion position in a complete process cycle, traffic jam distance, and congested extent of a guidance route generated at Step S22 are shown on a navigation picture, and displays it on the indicator 9.

[0051]It is distinguished whether the processing control part 7 arrived at a destination (Step S25). When the processing control part 7 had not arrived at a destination and it distinguishes, it returns processing to Step S21, and repeats processing of the above-mentioned steps S21-S25. On the other hand, when it distinguishes having arrived at a destination, the processing control part 7 ends navigation processing.

[0052]Next, the indicator image generation processing in the above-mentioned step S22 is explained in detail with reference to drawing 9. Drawing 9 is a flow chart for explaining indicator image generation processing.

[0053]First, the processing control part 7 distinguishes whether the traffic congestion list 61 memorized by the storage part 6 is ending with updating (Step S31). That is, after generating an indicator image last time using the traffic congestion list 61, it is distinguished whether the

traffic congestion list 61 memorized by the storage part 6 was updated.

[0054]The processing control part 7 advances processing to Step S36 mentioned later, when the traffic congestion list 61 was not updated and it distinguishes. On the other hand, when it distinguishes that the traffic congestion list 61 is ending with updating, the processing control part 7 specifies the scale of an indicator, etc. according to TWY data (Step S32). That is, the processing control part 7 specifies the scale rate of an indicator (gauge), etc. according to the present TWY data memorized by the storage part 6. If re retrieval of the TWY data is not carried out on the way, it is not necessary to specify the scale of an indicator, etc. each time.

[0055]The processing control part 7 acquires congestion information from the traffic congestion list 61 (Step S33). Namely, the processing control part 7 acquires one congestion information from the traffic congestion list 61 in predetermined order.

[0056]The processing control part 7 asks for the position and size in the indicator of a traffic congestion (confusion) display according to the acquired congestion information (Step S34). That is, from congestion information, the processing control part 7 specifies traffic jam distance, congested extent, etc., and asks for the symbols (the symbol 72 which shows the symbol 71 and confusion part which show a traffic congestion place, its size, etc.) which show the traffic jam distance and congested extent which were specified. The processing control part 7 asks for the corresponding traffic congestion position in an indicator.

[0057]It is distinguished whether the processing control part 7 processed all the congestion information (Step S35). That is, the processing control part 7 distinguishes whether it asked for the position of the traffic congestion (confusion) display in an indicator, etc. from all the congestion information contained in the traffic congestion list 61. When all congestion information was not processed and it distinguishes, the processing control part 7 returns processing to Step S33, and carries out repeat execution of the processing of the above-mentioned steps S33-S35.

[0058]On the other hand, when it distinguishes having processed all the congestion information, the processing control part 7 asks for the position in the indicator of a self-vehicle display according to the current position of a self-vehicle (Step S36). That is, the processing control part 7 asks for the position in the indicator of the symbol 73 which shows a self-vehicle position.

[0059]The processing control part 7 generates an indicator image (Step S37). That is, the processing control part 7 generates an indicator image containing the symbol 71 which shows a traffic congestion place, the symbol 72 which shows a confusion part, and the symbol 73 which shows a self-vehicle position.

[0060]An indicator image in which a traffic congestion position, traffic jam distance, and congested extent on a guidance route are shown is generated by this indicator image generation processing. And in above-mentioned navigation processing, it combines with a

navigation picture and an indicator image is displayed on the indicator 9. As a result, the user can also recognize visually easily a traffic congestion condition outside a display rectangle of a navigation picture with an indicator image in which a traffic congestion position, traffic jam distance, and congested extent on a guidance route are shown.

[0061]Next, traffic congestion place display processing is explained with reference to drawing 10 etc. Drawing 10 is a flow chart for explaining traffic congestion place display processing. It is started after above-mentioned navigation processing begins, and traffic congestion place display processing shown in drawing 10 is performed in parallel to navigation processing.

[0062]First, the processing control part 7 stands by processing until a traffic congestion (confusion) viewing area is chosen (Step S41). For example, the processing control part 7 stands by processing until the traffic congestion viewing area of the indicator image 70 shown in drawing 11 (a) is chosen by the selection cursor 74.

[0063]The processing control part 7 specifies the scale of an indicator, etc. according to TWY data, if a traffic congestion viewing area etc. are chosen (Step S42). That is, the processing control part 7 specifies the scale rate of an indicator, etc. according to the present TWY data memorized by the storage part 6. Like above-mentioned indicator image generation processing, if re retrieval of the TWY data is not carried out on the way, it is not necessary to specify the scale of an indicator, etc. each time.

[0064]The processing control part 7 searches for the traffic congestion place on the map corresponding to the selected viewing area (Step S43). That is, the position corresponding to the selected traffic congestion viewing area is pinpointed according to the scale of an indicator, etc., and the traffic congestion place on a corresponding map is searched for.

[0065]The processing control part 7 generates the navigation picture centering on a traffic congestion place (Step S44). That is, the processing control part 7 generates a navigation picture including a traffic congestion place according to the map information memorized by CD-ROM5. In that case, the processing control part 7 generates a navigation picture including the symbol which shows the target traffic congestion place according to the congestion information of the traffic congestion list 61.

[0066]The processing control part 7 compounds an indicator image in a navigation picture, and displays it on the indicator 9 (Step S45). For example, the processing control part 7 displays the navigation picture containing the arrow symbol 92 which shows a traffic congestion place as shown in drawing 11 (b). This traffic congestion place display processing's selection of the field of the traffic congestion display in an indicator image will display a navigation picture including the traffic congestion place corresponding to a traffic congestion display. As a result, the user can display the traffic congestion place outside a display rectangle by easy operation.

[0067]Although the traffic congestion condition was displayed on the indicator in the above-mentioned embodiment using the congestion information included in VICS information, the

regulation information included in VICS information may be used, and a regulation situation may also be displayed collectively. For example, in addition to the traffic congestion list 61, a navigation system memorizes the regulation list 62 as shown in drawing 12 (a) to the storage part 6. This regulation list 62 as well as the traffic congestion list 61 is updated one by one by the processing control part 7.

[0068]And the processing control part 7 generates the indicator image 70 containing the symbol 75 which shows speed regulation as used the regulation list 62 in above-mentioned indicator image generation processing, for example, shown in drawing 12 (b). With an indicator image as shown in drawing 12 (b), the user can recognize visually easily the regulating position and the contents of regulation on the guidance route outside the display rectangle of a navigation picture.

[0069]In the above-mentioned embodiment, although the complete process cycle of the guidance route was displayed with the indicator, the range displayed with an indicator is arbitrary. For example, the distance within the specific distance in the road which a guidance starting position - destination, 1st guide point - 2nd guide point, self-vehicle position - destination (guide point), and self-vehicle is running etc. may be displayed with an indicator. It may enable it to choose each of such distance arbitrarily by a user's specification. In the above-mentioned embodiment, although the indicator was shown in a straight line (rectangle), the shape of an indicator is arbitrary.

[0070]The navigation system concerning this embodiment of the invention cannot be based on a system for exclusive use, but can be realized using the usual computer system. [ for example by installing the program concerned from the media (a floppy (registered trademark) disk, CD-ROM, etc.) which stored the program for performing above-mentioned either in the computer provided with the GPS receiving function ] The navigation system which performs above-mentioned processing can be constituted.

[0071]The technique for supplying a program to a computer is arbitrary. For example, it may supply via a communication line, a communication network, a communications system, etc. If an example is given, the program concerned will be put up for the bulletin board (BBS) of a communication network, and this will be distributed via a network. And above-mentioned processing can be performed by starting this program and performing like other application programs under control of OS.

[0072]

[Effect of the Invention]As explained above, according to this invention, the traffic congestion condition outside a display rectangle can be displayed appropriately.

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[Translation done.]